

S/N 10/518,864

REMARKS:**I. Status of the Application.**

In the Office Action mailed April 3, 2007 (the "Office Action"): (1) claims 1 and 6 – 7 were rejected as anticipated under Section 102(b) based on Merten U.S. Patent No. 4,466,202 ("Merten" or the "Merten reference") (Office Action, page 2); (2) claims 13 – 17 were rejected as anticipated under Section 102(b) based on Smith et al. U.S. Patent No. 6,158,147 ("Smith" or the "Smith reference") (Office Action, page 3); (3) claims 2 – 5 were rejected as obvious under Section 103(a) based on Merten and the previously cited Prasad et al. U.S. Patent No. 4,934,148 ("Prasad" or the "Prasad reference") (Office Action, page 4); (4) claims 8 – 9 were rejected as obvious under Section 103(a) based on Merten in view of the previously cited McClenny U.S. Patent No. 4,982,512 ("McClenny" or the "McClenny reference") (Office Action, page 4); and (5) claims 18 – 20 were rejected as obvious under Section 103(a) based on Smith in view of Jaynes et al. U.S. Patent Application Publication No. US 2002/0125591 ("Jaynes" or the "Jaynes reference") (Office Action, page 4).

As previously amended, independent claims 1, 13 and 20 specifically claim a nitrogen-depleted gas mixture to dry materials in a specific manner.

This Merten, Smith, Prasad, McClenny, and Jaynes references are completely inapplicable to the present invention. In addition, the McClenny reference specifically teaches away from the claimed invention. The International Search Report (one page, attached) specifically found that these various references were "A-rated", meaning that they only describe the general state of the art and are not considered to be of particular relevance, which is significant evidence of the non-obviousness of the invention. These various references, therefore, alone or in combination, do not anticipate and do not render obvious the present invention as claimed.

II. The Rejections Under 35 U.S.C. §102 and §103 Should Be Withdrawn:

The cited references do not pertain to the subject matter of the claimed invention, which concerns drying solid materials, using a specific nitrogen-depleted mixture of gas to remove moisture from the material. By having removed nitrogen

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selectively from atmospheric air, in accordance with the invention, the resulting nitrogen-depleted gas mixture not only has increased percentage levels of oxygen as claimed, but also correspondingly increased percentage levels of carbon dioxide, hydrogen, the noble gases, and any gaseous impurities. Accordingly, this is a different gas mixture than what could be created by adding purified oxygen to air, as that resulting mixture would not have correspondingly increased percentage levels of these other gases. Specification, paragraphs 20, 21, 24, 34. A numerical example demonstrating the differences in the gas mixtures was previously provided and, in the interest of brevity, will not be repeated.

It is respectfully submitted that none of the prior art references disclose or suggest any such use of a nitrogen-depleted gas mixture, created by selectively removing a portion of nitrogen from atmospheric air, to remove water from solid materials, as claimed in the present invention.

The Patent Office has fundamentally misinterpreted Merten by confusing which gas stream does what and what each gas stream comprises. In Merten, the exhaust gases which leave the dryer 1 are circulated to a filter 2 where moisture/solvent passes through the filter (stream 19) leaving warm, dry gases behind consisting of nitrogen and oxygen (stream 13), which do not pass through the filter. The impermeability of the filter to nitrogen as well as oxygen is clearly stated in Merten at Column 5, lines 43 – 46. The moisture/solvent stream 19 is then passed through a compressor and thereafter a heat exchanger so that the heat energy in the moisture/solvent stream 19 can be transferred to the warm, dry gas stream 13. After the heat exchanger, it is the warm, dry gas stream 13 which is passed back to the dryer, not the moisture/solvent stream 19. Accordingly, the gases which are passed back to the dryer are nitrogen and oxygen enriched because other constituents of the gas stream have been removed by the filter 2.

Thus, with the process taught by Merten, at no point is nitrogen-depleted gas heated and then recycled back to the dryer. With respect to the dependent claims 2 – 5, the recited percentages are not disclosed in Merten or in Prasad. Essentially, the patent office has confused the moisture/solvent stream with the dry gases stream. Accordingly, Merten is irrelevant to the present invention, as found in the International Search Report.

The Smith reference has also been misinterpreted by the Patent Office. With the grain drying apparatus taught in Smith, Figures 3 to 7 illustrate apparatus that

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includes a membrane filter whereby oxygen is removed from the gases which will result in a gas stream which is enriched in nitrogen (see Column 6, lines 51 – 56). The fact that an oxygen deficient / nitrogen enriched stream is used in the heating and drying process is repeatedly stated throughout the Smith reference (see, e.g., Column 5, lines 45 – 52 and Column 6, lines 12 – 19). Accordingly, Smith is also irrelevant to the present invention, also as found in the International Search Report.

The present invention, on the other hand, requires a nitrogen-depleted gas which has the effect of enriching the oxygen in the gas by volume. This is diametrically opposite to the processes described in the newly-cited Smith and Merten references.

In view of the fact that neither citation contemplates or teaches depleting nitrogen from the gas stream which is recycled back to the dryer, there can be no grounds for a finding of obviousness or anticipation. In fact, both citation teach away from the present invention, teaching either the retention or enrichment of nitrogen in the gas stream.

With respect to the Prasad reference the patent office will perhaps appreciate that the differences between the dryer of Prasad and the present invention are significant: (1) in Prasad, the air at the outlet of the dryer is drier than that at the inlet; (2) in the present application, the nitrogen-depleted gas mixture at the outlet is “wetter”, having been used to absorb water from the material. The system described in Prasad does not include a heater, as claimed in the present invention; this is not surprising, as the Prasad reference is concerned with *cryogenic* gas separation. In addition, the Prasad adsorption system also is not a dryer, as it removes contaminants, not moisture, from the compressed air; in contrast, in the claimed invention, the dryer removes moisture from the solid material within the dryer using the nitrogen-depleted gas mixture.

The McClenny reference also does not disclose and does not suggest the present invention, and specifically teaches away from the present invention. The McClenny reference utilizes pure nitrogen as the drying gas, not a gas mixture of atmospheric air from which a portion of nitrogen has been removed, *i.e.*, not a nitrogen-depleted gas mixture of the present invention. In McClenny, an oven is utilized to extract organic solvents; whereas the dryer of the present invention is adapted to extract moisture, *i.e.*, water.

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With reference to claims 8 and 9, neither Merten nor McClenny teach the removal of nitrogen from atmospheric air to create a nitrogen-depleted gas mixture which will then be utilized for extracting moisture from a solid material. Accordingly, these claims cannot be considered obvious in light of the Prasad and McClenny references. Indeed, McClenny specifically uses pure nitrogen for the circulating gas. In addition, the molecular sieve of McClenny is used to extract organic solvents from the circulating nitrogen gas, not to reduce the amount of nitrogen to create a new mixture for a circulating gas.

Accordingly, the McClenny reference specifically teaches away from the present invention: the present invention utilizes a nitrogen-depleted gas mixture, while McClenny utilizes the opposite, namely, pure nitrogen. Such teaching away is the antithesis of art suggesting that a person of ordinary skill go in the claimed direction. See *In re Fine*, 873 F.2d 1071 (Fed. Cir. 1988). This teaching away from Applicants' invention is a *per se* demonstration of lack of obviousness and a lack of anticipation. Indeed, in the recent *KSR International Co. v. Teleflex Inc. et al.* decision, the Supreme Court affirmed that such teaching away is a substantial indication of non-obviousness of the invention. April 30, 2007 Slip Op. at 12. In addition, any assertion that these references disclose a nitrogen-depleted drying gas would be to improperly "read into the prior art the teachings of the invention" and would be "falling prey to hindsight bias". *KSR International*, April 30, 2007 Slip Op. at 17.

More specifically, none of the cited references disclose or suggest the claimed elements of the present invention, such as: (1) removing moisture from a material in a dryer, in which (2) the drying gas is specifically a nitrogen-depleted atmospheric air mixture, which (3) is heated and fed to a dryer where moisture is extracted from a solid material, and (4) where a portion of the nitrogen-depleted drying gas mixture is recirculated back to the heater.

The Jaynes reference, cited with respect to claims 18 - 20, is also inapplicable to the present invention. The Jaynes reference concerns the creation of an atomized powder, not the removal of moisture from a material using a nitrogen-depleted gas mixture. Accordingly, the Smith and Jaynes references, alone or in combination, also do not disclose and do not suggest the present invention.

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In addition, the present invention claims novel elements which were not disclosed in the prior art whatsoever, so the present application is not a matter of a combination of elements found in the prior art, unlike the patent claim at issue in *KSR International*, April 30, 2007 Slip Op. at 11. Because the prior art does not disclose these novel elements, "an obviousness [rejection] cannot be sustained by mere conclusory statements" and there can be no "rational underpinning" for such a conclusion. *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006), cited approvingly in *KSR International*, April 30, 2007 Slip Op. at 14.

Moreover, there is no identified reason or motivation to combine the Merten, Smith, Prasad, McClenny and Jaynes references, which is still required for obviousness under *KSR International*, April 30, 2007 Slip Op. at 15. In addition, identification of any individual part claimed is insufficient to defeat patentability of the whole claimed invention. See *In re Kotzab*, 217 F.3d 1365 (Fed. Cir. 2000). Accordingly, no *prima facie* showing of potential anticipation or obviousness has been made, and any assertions to the contrary have been clearly rebutted. *In re Rouffet*, 149 F.3d 1350 (Fed. Cir. 1998); *In re Mills*, 916 F.2d 680 (Fed. Cir. 1990).

The present invention, therefore, is not anticipated and is not rendered obvious by the Merten, Smith, Prasad, McClenny, and Jaynes references under Sections 102 and 103, and the rejection of the claims should be withdrawn. In addition, because the remaining dependent claims incorporate by reference all of the limitations of the corresponding independent claims, all of the dependent claims are also allowable over the cited reference. The new independent claim 20, derived from the independent claims and various dependent claims, is also allowable as indicated in the Office Action.

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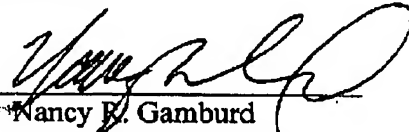
On the basis of the above amendments and remarks, reconsideration and allowance of the application is believed to be warranted, and an early action toward that end is respectfully solicited. In addition, for any issues or concerns, the Examiner is invited to call the attorney for the Applicants at the telephone number provided below.

Respectfully submitted,

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May 31, 2007

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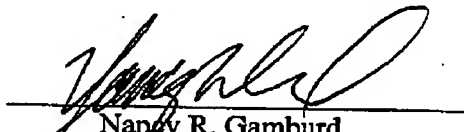
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CERTIFICATE OF FACSIMILE TRANSMISSION

I hereby certify that the foregoing Amendment And Response Under 37 CFR 1.111 and 1.115 (8 pages with one page attachment), and Transmittal (PTO/SB/21) (1 page) (10 pages total), for George Svonja, Serial No. 10/518,864, entitled "Method and Apparatus for Drying", have been transmitted by facsimile to the US Patent and Trademark Office to fax number (571) 273-8300 (Centralized Facsimile Number), on May 31, 2007.


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INTERNATIONAL SEARCH REPORT

International Application No
PCT/GB 03/02702

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 F26B21/14 F26B21/04

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 F26B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	GB 703 599 A (HUGH SPARKES) 3 February 1954 (1954-02-03) the whole document	1,13
A	US 2 236 398 A (DRUMMOND FOLSOM E) 25 March 1941 (1941-03-25) the whole document	1,13
A	US 4 466 202 A (MERTEN ULRICH) 21 August 1984 (1984-08-21) the whole document	1,13
A	US 5 108 968 A (BARNES JAMES W ET AL) 28 April 1992 (1992-04-28)	
A	US 6 158 147 A (MUELLER WAYNE ET AL) 12 December 2000 (2000-12-12)	

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents:

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubt on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, each combination being obvious to a person skilled in the art.

A document member of the same patent family

Date of the actual completion of the international search

6 October 2003

Date of mailing of the international search report

13/10/2003

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